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Regret in Decision Making

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Abstract

Decision research has only recently started to take seriously the role of emotions in choices and decisions. Regret is the emotion that has received the most attention. In this article, we sample a number of the initial regret studies from psychology and economics, and trace some of the complexities and contradictions to which they led. We then sketch a new theory, decision justification theory (DJT), which synthesizes several apparently conflicting findings. DJT postulates two core components of decision-related regret, one associated with the (comparative) evaluation of the outcome, the other with the feeling of self-

blame for having made a poor choice. We reinterpret several existing studies in DJT terms. We then report some new studies that directly tested (and support) DJT, and propose a number of research issues that follow from this new approach to regret.

Keywords

regret; decision making; emotion; decision justification theory

Decision researchers have only recently started to take seriously an aspect of making choices that every lay person already knows about: Making a choice, whether of a vacation destination, a spouse, a medical treatment, or a career, can be

an intensely emotional experience. Of course, most people give such decisions careful thought: What are the options? What consequences might each lead to? How likely are they? How desirable are they? But, in addition to these important cognitive considerations, there are strong emotional factors. At the time of the decision, the person has feelings about the decision itself (fear of surgery, anxiety about a career choice) and expectations about feelings he or she may experience later (relief at a good outcome, sadness at a poor one). After the fact, the individual experiences emotions, which may or may not track with the earlier expectations.

The emotion that has received the most research attention from decision theorists is regret. Most people can readily recall or imagine situations in which a poor decision led to painful regret. In the early 1980s, researchers in both laboratory and field settings started to produce elegant theories and vivid demonstrations of the antecedents and consequences of regret. Continued research through the 1990s overturned some of these early

findings, modified others, and led to a more complex and comprehensive understanding of regret in decisions.

In this short review, we first sample a number of the initial studies, and trace some of the complexities and contradictions to which they led. We then sketch a new model that synthesizes these apparently conflicting findings and identify several research issues for new work.

EARLY STUDIES

Perhaps the best-known of the early regret studies is by Kahneman and Tversky (1982). They asked students to assess the regret that would be felt by two investors, both of whom lose \$1,200, one as a result of buying a particular stock, the other as a result of holding on to the same stock. A stunning 92% of the respondents guessed that the active buyer would feel more regret than the passive holder. A bad outcome resulting from action seemed to be more regrettable than the same bad outcome when it was the result of inaction.

Intriguingly, just the opposite pattern emerged from a series of studies by Gilovich and Medvec (1995) looking at retrospective regrets. People asked to recall real-life regrets tended to recall omissions more frequently than commissions, the adventures they had passed up rather than the leaps they had taken. Gilovich and Medvec argued that regret follows a characteristic temporal pattern: Regrettable actions hurt more than omissions in the short run, but when looking back, people experience more regret over paths not taken. Research we describe later showed, however, that people may regret inactions more than actions in the short run also.

Economic choice theorists (e.g., Loomes & Sugden, 1982) have also

studied regret (though their use of the word differs from ordinary usage; Connolly & Butler, 2002). These theorists predicted that people would feel regret if a decision outcome was worse than what they would have received by choosing a different option, and that they would try to avoid options that exposed them to this possibility. Initial studies seemed to confirm these predictions, but newer experiments (e.g., Starmer & Sugden, 1993) suggest that these studies were flawed. As a result, research in this tradition seems mainly to have stopped. There is, however, good evidence that choices are influenced by anticipated regret, and that such anticipation is affected by whether or not one expects to learn the outcomes of unchosen options (Zeelenberg, 1999).

DECISION JUSTIFICATION THEORY

To accommodate these conflicting results, we propose a model of regret called decision justification theory (DJT). DJT postulates two core components of decision-related regret, one associated with the (comparative) evaluation of the outcome, the other with the feeling of self-blame for having made a poor choice. The overall feeling of regret at some decision is a combination of these two components: You regret both that the outcome is poorer than some standard (often the outcome of the option you rejected) and that the decision you made was, in retrospect, unjustified.

The two components do not necessarily go together. Someone might experience high self-blame regret even when the outcome is good. Suppose that you leave a party somewhat inebriated and decide to drive home rather than take a cab. You arrive home safely, but the following morning you are racked with regret as you think back

on your decision. You knew at the time that you had had too much to drink, and that options were available. You have no excuse: Your decision to drive was entirely unjustified, and could easily have led to disastrous outcomes. The actual outcome was good, but you still feel regret.

Compare this with another scenario: Imagine yourself as a parent trying to decide whether or not to vaccinate your 1-year-old against some serious disease. You consult doctors, gather information, think long and hard, and decide to vaccinate, despite knowing the vaccine sometimes has bad side effects. You are unlucky, and your child suffers the bad side effects. Of course, you regret this misfortune: The outcome is not what you had hoped (and would not have happened if you had decided against vaccination). But, even in retrospect, you see no reason to blame yourself. You did everything a prudent parent could to make the best possible choice. Your decision was fully justified (as comforting friends will remind you; being absolved from blame is a great way to reduce regret). Driving home drunk leaves you with self-blame regret but (if you are lucky) no bad-outcome regret; an unfortunate vaccination result leaves you feeling bad-outcome regret, but not the extra pain of self-blame.

Of course, most decisions that result in bad outcomes generate some mixture of these two regret components. Sometimes a decision that felt well justified at the time appears unjustified later. Crawford, McConnell, Lewis, and Sherman (2002), for example, induced experimental participants to follow the (bad) advice of an unknown stranger as to which of two football teams to bet on, despite having detailed and useful information on which to base their bets. At the decision point, most participants followed the stranger's advice. In retrospect,

after they had bet and lost, they seemed to scold themselves: "How could I have been so stupid? In retrospect, there was no reason for me to trust this anonymous tipster. My decision was unjustified." In this case, the regret appears to have involved both poor-outcome and self-blame components.

DJT provides a parsimonious account of many earlier findings on regret. For example:

- Simonson (1992) offered students two imaginary choices: whether to take advantage of a current, moderate sale or wait for a later, possibly better sale, and whether to buy a bargain-brand VCR or a more expensive, well-known, high-quality brand (a SONY). Control subjects displayed no clear preference in either choice, but subjects asked to think about the regret they might feel after making their decision predominantly chose the safer options (the current sale and the SONY). Apparently thinking about regret led them to look for justifications for their choices, and the safer brand and guaranteed sale offered the justification they were looking for.
- In separate studies of the role of decision responsibility in regret (Connolly, Ordóñez, & Coughlan, 1997; Zeelenberg, Van Dijk, & Manstead, 2000), we explored how students expected to feel if they changed course sections and then found the section they moved into was better than, worse than, or the same as the section they had left. Students who made the decision for themselves expected to feel more regret if the outcome was bad (and more rejoicing if the outcome was good) than students who had the same outcome imposed on them by an arbitrary computer reassignment. However, even the computer-assigned students expected to

feel substantial regret for a bad outcome, despite having no decision responsibility. Apparently (though neither of us interpreted the results this way at the time), the computer-assigned group expected only outcome-evaluation regret, whereas the self-choice group considered possible self-blame regret as well. (It is also interesting that the key reference point in all these studies was the status quo, the quality of the course section initially assigned. A variety of reference points may be involved in regret-related comparisons.)

- In another study (Zeelenberg, Van den Bos, Van Dijk, & Pieters, 2002), participants were asked how much regret a soccer coach would feel if his team lost after he either changed or did not change the team—a soccer parallel of the two-investors problem discussed earlier. As in the case of the investors, participants expected more regret for the active than for the inactive coach—but only if the team had previously been enjoying a winning record. If the team had been losing, the *inactive* coach was seen as feeling more regret. In DJT terms, the winning coach was unjustified in changing his team, and can thus be blamed for the subsequent loss. In contrast, the losing coach was justified in making changes, even if they did not immediately work out, and thus was expected to feel less blame, and less regret.
- Seta, McElroy, and Seta (2001) ran a between-subjects replication of the two-investors problem, but attaching short personality sketches of the investors as either cautious risk avoiders or entrepreneurial risk takers. They replicated Kahneman and Tversky's original result (more regret expected for action than for inaction) for the cautious investors,

but found the reverse for the bolder investors, who were seen as regretting losses from inaction more than losses from action. Apparently behavior can sometimes be justified by its consistency with one's personality.

These are, of course, simply post hoc reinterpretations in DJT terms of findings from existing studies (though we are impressed with the ease with which the theory resolves apparently conflicting results). We have also undertaken several direct tests of the theory. In one (Connolly & Reb, 2002), we took three scenarios (the vaccination, two-investors, and soccer-coach problems) and asked subjects to assess a range of emotions the protagonists might feel if the decision turned out badly. We also asked them to rate five short arguments that one might use to guide decision making in each context (e.g., "When it comes to [this topic], I just have to trust my gut instincts about what to do"; "It is better to sit still in situations like this than to take action"). Half the participants evaluated these arguments before, and half evaluated them after, assessing the protagonists' likely emotions. Considering the arguments was intended to prime the participants with a range of alternative rationales that could mitigate the feelings of decision-related regret when things went wrong. In two of the three scenarios, this is exactly what we found: For both the vaccination and the soccer-coach scenarios, the active protagonist was seen as significantly less regretful by participants who had just read the justificatory arguments than by those who had not. (Interestingly, the appropriateness of the arguments varied significantly across scenarios. A justification that is perfectly appropriate for an investment decision may be seen as inappropriate for a health-care decision for one's child.)

A second test of DJT (Inman & Zeelenberg, 2002) studied consumer regrets. In the scenarios used in this study, consumers either made repeat purchases or switched products. In some experimental conditions, subjects got information justifying the consumer's decision (e.g., she had bought the product only once before, found it unsatisfactory, and switched); in other conditions, the decision seemed unjustified (e.g., she had bought the product several times before, liked it, but switched anyway). The study showed that regret over poor outcomes was associated not with whether the consumer switched or stayed, but with whether or not the decision was justified.

A third set of related studies (Pieters & Zeelenberg, 2002) examined the regret people experience when they behave in ways they did not originally intend. These studies showed that such inconsistency, which is often hard to justify, amplifies regret independently of the outcomes of the behavior. This inconsistency effect was obtained using a scenario approach (Study 1), when people were asked about autobiographical memories of regrettable events (Study 2), and in a longitudinal study of a significant real-life decision, voting in national elections (Study 3). These results suggest that the notion of justifiability as put forward in DJT may also explain other effects of decision procedures on regret.

FUTURE DIRECTIONS

We have been surprised too often in our studies of regret to prophesy with any confidence where the next steps will come, but there are plenty of excellent research topics available. As yet, psychologists know almost nothing about the sorts of arguments that make for good justifications, whether

people vary systematically in the justifications they find compelling, and whether people produce justifications spontaneously or only under prompting. Understanding the production of justifications might provide a basis for "regret therapy," for helping people find the rationales that will work for them in reducing painful regret. It might even help them make better decisions. For example, when we asked subjects to rate justifications (Connolly & Reb, 2002), one of the best general-purpose justifications was that one made a careful, competent decision based on a wide range of input information. If anticipated regret led people to engage in thoughtful decision making of this kind, it could lead directly to improved decision making.

We are also eager to explore the effects of decision-related rejoicing, if that is the positive emotion that corresponds to regret. (Preliminary data in Connolly & Butler, 2002, suggest that regret and rejoicing may not be simple polar opposites.) Certainly people expect positive decision outcomes to lead to rejoicing, though as yet there is little evidence that justification affects such rejoicing. Good outcomes seem not to provoke the sorts of soul-searching that trigger regret and the search for justification. Regret and rejoicing may thus be driven by rather different mechanisms, and are not necessarily mirror images of one another.

The issues, then, are wide open. The emotional side of decision making is clearly important, but researchers are only now starting to understand it. Compared with the huge research literature describing how people think, and should think, about their decisions, the research on how people feel in and about the decision-making process is in its infancy. The research we have sketched here considers one emotion, regret, and describes some of the subtle ways in which it influences, and is

influenced by, the choices people make. As researchers improve their understanding of regret and other decision-related emotions, people should be able to improve their choices, and their feelings about the consequences of those choices. We feel good about the prospect.

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Is Laughter the Best Medicine? Humor, Laughter, and Physical Health

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Abstract

This article examines research evidence for the popular idea that humor and laughter have beneficial effects on physical health. Potential theoretical mechanisms for such effects are discussed first. Empirical evidence for beneficial effects of humor and laughter on immunity, pain tolerance, blood pressure, longevity, and illness symptoms is then summarized. Overall, the evidence for health benefits of humor and laughter is less conclusive than commonly believed. Future research in this area needs to be more theoretically driven and methodologically rigorous.

Keywords

humor; laughter; health; immunity; pain

Belief in beneficial effects of humor and laughter on physical health has become increasingly popular in recent years. The media frequently report claims about scientific evidence for health benefits of humor and laughter. Some practitioners have even begun to advo-

cate the use of "therapeutic humor" in the treatment of illness and maintenance of health, and clowns and comedy carts have become familiar sights in many hospitals. The idea that laughter is good for one's health can be traced to biblical times, and was revived periodically by various physicians and philosophers through the centuries. In recent decades, interest in the healing power of laughter was given new impetus by the best-selling account by Cousins (1979) of his recovery from a progressive and painful rheumatoid disease after treating himself with daily bouts of laughter, along with massive doses of vitamin C.

THEORETICAL MECHANISMS

How might humor and laughter influence physical health? There are at least four potential mechanisms, each involving a different aspect of humor, and each suggesting different implications for the application of humor to well-being. First, laughter might produce physiological changes in various systems of the body, which may have beneficial effects on health. Various authors have sug-

gested, for example, that vigorous laughter exercises and relaxes muscles, improves respiration, stimulates circulation, increases the production of pain-killing endorphins, decreases the production of stress-related hormones, and enhances immunity. According to this theoretical model, hearty laughter is crucial in the humor-health connection, whereas humorous perceptions and amusement without laughter would not be expected to confer any health benefits.

Second, humor and laughter might affect health by inducing positive emotional states, which may in turn have beneficial effects on health, such as increasing pain tolerance, enhancing immunity, and undoing the cardiovascular consequences of negative emotions (Fredrickson, 2000). Compared with the first model, this model gives humor and laughter a less unique role in health enhancement, as they are only one means of increasing positive emotions, along with love, joy, optimism, and so forth. Furthermore, according to this model, overt laughter may not even be necessary for health benefits to occur, because humor and amusement may induce positive moods even without laughter.

Third, humor might benefit health indirectly by moderating the adverse effects of stress on health. A considerable body of research indicates that stressful life experiences can have adverse effects on various aspects of health, including suppression of the immune system and increased risk of infectious disease and heart disease (O'Leary,